HYGIENE AND PUBLIC HEALTH

UNDER THE CHARGE OF

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The Behavior of Cultures of Chick Embryo Tissue Containing Avian Tubercle Bacilli.—SMITH, WILLIS and LEWIS (*Am. Rev. Tuberc.*, 1922, **6**, 21) state that tissue cultures afford a means by which the behavior of living cells toward living tubercle bacilli can be followed under experimental conditions which are not greatly injurious to either form. Such observations have shown that: (1) Tubercle bacilli were taken in by clasmatocytes, fibroblasts, white blood cells, endothelial cells, mesothelial cells, ectodermal cells, liver cells, kidney tubule cells, and cells lining the bronchioles and alveoli of the lungs. No microörganisms were observed in red blood cells, striated muscle cells, nerve cells or ciliated epithelial cells. (2) The phenomena accompanying the appearance of tubercle bacilli within these cells were precisely the same as those shown by similar cells in regard to other foreign bodies. Entrance into cells was dependent upon the consistency of the cytoplasm of the cell, the composition of the foreign body, and also the position of the foreign body in relation to the surface of the cell. (3) Contrary to the generally accepted idea, the cell did not make any active movements toward the bacillus, nor was any migration of bacilli toward the cell observed. (4) The number of microörganisms taken in by the cell and the rapidity of the process varied greatly with the different types of cells. The clasmatocytes were the most active; after that, the giant cell, the non-granular white blood cell, the granular white blood cell, and the fibroblast, in the order named. (5) Once inside the cell, the bacilli were moved back and forth in the cytoplasm in a manner characteristic of included foreign bodies. In course of time a small vacuole formed about the microörganism, which was eventually destroyed. (6) The presence of tubercle bacilli within the cell or in the explant did not stimulate the formation of giant cells. The emulsion injected into the peritoneum of pigeons produced progressive disease of moderate severity.

Experimental Studies on the Etiology of Typhus Fever.—OLITSKY (*Jour. Exp. Med.*, 1922, **25**, 121) presents experiments to show that the typhus virus in the tissues of the guinea-pig during the height of reaction to the experimental disease does not lose its infecting power when the cells of the brain or of the spleen are disintegrated by repeated freezing and thawing, or by freezing and desiccating, or by crushing by mechanical means, or by grinding into a homogeneous pulp with sand. He states that the virus after such treatment is as actively infective as in the same tissue not subjected to the disintegrating influences. The possibility exists, therefore, of an extracellular condition of the typhus virus. Fourteen attempts to filter through Berkefeld V and N candles the virus contained in the disintegrated tissue have all resulted in failure.

The Bacteriology of the Blood of Dogs with Eck Fistula.—As "there is an impression, supported by considerable evidence, that organisms from the bowel often enter the portal stream and in the liver are effectively disposed of," Davis and Mathews (*Jour. Infect. Dis.*, 1921, **29**, 313) conceived the idea that proper conditions to test this point might be furnished by Eck fistula—that is, an artificial communication between the portal vein and vena cava with the portal vein ligated above the anastomosis just at the hilus of the liver. The experiments were performed on Eck fistula dogs and consisted in taking blood cultures at varying intervals after the operation, as well as after the introduction of Bacillus pyocyaneus and Bacillus subtilis into the stomach and Staphylococcus albus into the venous circulation. All experiments were controlled by similar observations on normal dogs. It was found that in dogs with Eck fistula, bacteria do not appear in the circulation in any appreciable numbers; that Eck fistula dogs are no more susceptible to infection of lungs or of the other organs than are normal dogs and that microörganisms disappear from the circulation as rapidly in dogs with Eck fistula as in normal dogs.

Experimental Streptococcus Pneumonia and Empyema, III.—Having previously produced experimental Streptococcus empyema in rabbits by direct injection into the pleural cavity of very small amounts of a passage strain of Streptococcus pyogenes, Gay and Rhodes (*Jour. Infect. Dis.*, 1921, **29**, 217) have repeated, experimentally, what is presumably the entire life history of this form of infection in man and have been able to furnish light on its exact course. By means of a soft rubber catheter pushed down the trachea amounts of culture varying from 0.01 up to 10 cc were insufflated into the bronchi of 18 rabbits. All developed bronchopneumonia followed by empyema. It was found necessary to force a small volume of air into the lungs after the streptococcus culture had been introduced into the trachea through the catheter. Similarly, pneumococcus (Type I) cultures were injected intrabronchially into a small series of rabbits. The microscopical findings in the involved areas were quite distinct from the lesions produced by the streptococcus. Death was due to a septicemia which was only irregularly encountered in the streptococcus infections. In the streptococcus infections the pneumonia is lobular in distribution, necrotizing in effect, does not resolve readily and is characterized by peribronchial and perivascular edema and later infiltration of mononuclear cells, being different from the pneumonia produced by the pneumococcus. In the streptococcus infection, pleurisy with effusion occurred, involving by extension both pleural cavities and the pericardium. It was found that the natural route of infection with the streptococcus seems to be from alveoli to pleura, rather than by the